

1. (a) Draw circuit diagram of Hartley oscillator. Explain its working & derive the expression for its frequency of oscillation. [07]
- OR**
- (a) Draw circuit diagram of Collpits oscillator .Explain its working & derive the expression for its frequency of oscillation. [07]
- (b) Draw circuit diagram of voltage shunt feedback in CE transistor amplifier. Explain its working & derive equation for voltage gain. [06]
- OR**
- (b) How many methods are there to obtain negative feedback ? Describe current series feedback. [06]
2. (a) What are the characteristics of an ideal operational amplifier ? [08]
- OR**
- (a) Explain the basic construction and Characteristics of the JFET. [08]
- (b) Write a note on 'CMRR'. [05]
- OR**
- (b) Define an op-amp .What is inverting and non-inverting operational amplifier ? Draw basic symbol of operational amplifier with label. [05]
3. Do the following:(Any Six) [12]
- (i) Show the 8 bit subtraction of following decimal numbers in 2's complement representation -43, -78
- (ii) Express the decimal numbers +127 and -107 in 8-bit sign magnitude form.
- (iii) Convert the sign-magnitude number 1010 1010 into decimal equivalent.
- (iv) Convert the decimal number +25 and -78 into 2-s complement representation.
- (v) Show the binary subtraction of $125_{(10)}$ from $200_{(10)}$.
- (vi) Show the 8 bit addition following decimal numbers in 2's complement representation: +37,-115
- (vii) Multiply the binary number 110111 by 110001 .
- (viii) Divide the binary number 110111 by 11 .
- OR**
3. Explain 4-to-1 multiplexer. What is demultiplexer? Explain 1-to-16 demultiplexer. [12]
4. (a) Explain Magnetostatic deflection of a spot with mathematical equation. [06]
- OR**
- (a) Discuss transistor series voltage regulator . [06]
- (b) Explain Electrostatic deflection of a spot with mathematical equation. [06]
- OR**
- (a) Discuss transistor shunt voltage regulator . [06]

QUIZ

Total marks : 10

- (1) Define 'Slew Rate' for an opamp.
- (2) What are the applications of operational amplifier ?
- (3) Define ' Input offset current' .
- (4) Give the symbol of n-channel JFET.
- (5) Add the binary numbers $111 + 111 + 111$.
- (6) Subtract 010111 from 110001 .
- (7) Give the truth table of half-adder.
- (8) What is Oscillator ?
- (9) What is positive feedback ?
- (10) Give the applications of CRO.